SERVICING OF MOTOR VEHICLE AIR CONDITIONERS

Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the process the support services subcontractor personnel perform while maintaining, servicing, and repairing, of Los Alamos National Laboratory (LANL) motor vehicle air conditioners (MVACs) and MVAC-like appliances to meet the requirements of 40 CFR §82, Subpart B.

Scope

This procedure applies to any LANL or support services subcontractor personnel who service, maintain, and repair LANL MVACs and MVAC-like appliances.

In this Procedure

This procedure addresses the following major topics:

Hazard Control Plan

RRES-MAQ personnel do not perform the non-office work steps in this procedure; thus no Hazard Control Plan has been prepared. It is the responsibility of the LANL or the support services subcontractor supervisors of personnel performing this process to ensure all applicable hazards analyses have been performed according to applicable requirements.

Signatures

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General information about this procedure

Attachments

This procedure has the following attachment:

Number	Attachment Title	No. of pages
1	Refrigerant Cylinder Action Form	1
2	Service Form	1
3	Motor Vehicle Refrigerant Cylinder Log	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	4/8/03	New document.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- Certified technicians responsible for maintaining, servicing, and repairing of MVACs or MVAC-like appliances containing refrigerants.
- Support services subcontractor refrigerant compliance coordinator (RCC).
- RRES-MAQ **refrigeration team personnel**.

The following personnel **do not** require training to this procedure:

- Gas Plant personnel who issue cylinder tags

Training method

The training method for this procedure is **classroom** instruction for the support service subcontractor personnel and **read (self-study)** for all other personnel. All training is documented in accordance with the MAQ procedure for training (MAQ-024).

Prerequisites

In addition to training to this procedure, the following certification is also required by **refrigeration technicians** prior to performing work on any MVAC or MVAC-like refrigeration appliance/equipment:

- Appropriate EPA type certification for the equipment to be repaired.

General information, continued

Acronyms used in this procedure

CAA – Clean Air Act Amendments

CFC – Chlorofluorocarbons

CFR – Code of Federal Regulations

EPA – Environmental Protection Agency

HCFC – Hydrochlorofluorocarbons

HFC – Hydrofluorocarbons

MVAC – Motor Vehicle Air Conditioner

ODS – Ozone Depleting Substances

RCC – Refrigerant Compliance Coordinator

RCRA – Resource Conservation and Recovery Act

Definitions specific to this procedure

Motor vehicle: any vehicle which is self-propelled and designed for transporting persons or property on a street or highway, including but not limited to passenger cars, light duty vehicles, and heavy duty vehicles. This definition does not include a vehicle where final assembly of the vehicle has not been completed by the original equipment manufacturer. [40 CFR §82 Subpart B].

Motor vehicle air conditioner (MVAC): any appliance/equipment used to cool the driver's or passenger's compartment of a motor vehicle**. Exception: appliance/equipment used on motor vehicles for refrigerated cargo or air conditioning systems on passenger buses using HCFC-22 refrigerant.**

MVAC-like appliance: mechanical vapor compression, open-drive compressor appliances/equipment used to cool the driver or passenger's compartment of a non-road motor vehicle. This includes the air-conditioning equipment found on agricultural or construction vehicles. **This definition is not intended to cover appliances/equipment using HCFC-22 refrigerant.**

General information, continued

Definitions specific to this procedure, *continued*

Refrigerant: the fluid used for heat transfer in a refrigerating system; the refrigerant absorbs heat and transfers it at a higher temperature and a higher pressure, usually with a phase change. Refrigerants include but are not limited to, Class I and Class II ozone-depleting substances designated as such in 40 CFR §82, "Stratospheric Ozone Protection," Subpart A, "Production and Consumption Controls," Some examples of refrigerants are CFCs, HCFCs, HFCs, and any other substance designated by EPA at a later date. Refrigerant blends (mixtures of two or more different chemical compounds) also constitute refrigerants [40 CFR §82 Subpart B].

Service involving refrigerant: any service during which discharge or release of refrigerant from the MVAC or MVAC-like appliance to the atmosphere can reasonably be expected to occur. Service involving refrigerant includes any service in which an MVAC or MVAC-like appliance is charged with refrigerant but no other service involving refrigerant is performed (*i.e.*, a "top-off").

Technician: any person who performs maintenance, service, or repair that could be *reasonably expected to release refrigerants* from MVACs or MVAC-like appliances into the atmosphere. Technician also means any person who performs disposal of MVACs, and MVAC-like appliances that could be reasonably expected to release refrigerants into the atmosphere. Technician includes, but is not limited to, installers, contractor employees, support services subcontractor personnel, and in some cases, owners.

References

The following documents are referenced in this procedure:

- RRES-MAQ-024, "Personnel Training"
- 40 CFR §82 Subpart B

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Who may perform work to this procedure?

Technician certification

Only refrigeration technicians properly certified by an EPA approved technician certification program are allowed to perform work on MVACs or MVAC-like appliances. The support services subcontractor ensures all of the technicians are appropriately certified along with the records of their certifications up-to-date, and submits copies of proof of technician EPA certification to RRES-MAQ.

Training to this procedure must be documented (see page 2) before any work on MVACs or MVAC-like appliances at LANL is performed.

Note: The technician certification required to perform work under motor vehicle air conditioners (40 CFR §82 Subpart B) is different than the technician certification required to perform work on non-MVAC or non MVAC-like appliances/equipment containing refrigerant (40 CFR §82 Subpart F).

Demonstration of certification

Authorized representatives of EPA may require technicians to demonstrate, on the business entity's premises, their ability to perform proper procedures for recovering and/or recycling refrigerant. Failure to demonstrate or failure to properly use the equipment may result in revocation of the technician's certificate by EPA. Technicians whose certification is revoked must be recertified before servicing or repairing any motor vehicle air conditioners.

Section 608 and Section 609 overlap

Section 608 of the CAA of 1990 directs EPA to establish requirements to prevent the release of ODS during the service, repair, or disposal of appliances/equipment and industrial process equipment. Section 609 of the CAA establishes standards specifically for the service of MVACs.

MVACs are included in the definition of appliances under the definition in Section 608; however, since their service and repair are regulated under Section 609, they are not subject to the servicing requirements under Section 608. Procedures involving MVACs that are not covered by Section 609, such as the disposal of MVACs, are covered by Section 608. Below is information concerning specific areas where the overlap between these two sets of regulation may require additional clarification:

Note: While buses using CFC-12 are MVACs, buses using HCFC-22 are NOT MVACS or MVAC-like appliances, but rather high-pressure equipment covered under Type II Section 608.

Who may perform work to this procedure?, continued

Technician certification

Both Section 608 and 609 require that technicians become certified. Technicians who repair or service MVACs must be trained and certified by an EPA-approved Section 609 program. These programs cover MVAC recycling equipment and Section 609 regulatory requirements. The MVAC technicians must pass a test to become certified. These tests are different from the Section 608 certification tests.

Under Section 608, EPA has established four types of certifications for technicians that service and repair appliances/equipment other than MVACs. These technicians must pass a test in each type to be certified in the appropriate area. The four types of certifications are:

- Type I (small appliances/equipment)
- Type II (high pressure appliances/equipment) except for small appliances and MVACs
- Type III (low pressure appliances/equipment
- Type IV (Universal: all appliances/equipment except MVACS)

Technicians who service and repair MVAC-like appliances (e.g. farm equipment and other non-road vehicles) can choose to be certified by either Section 609 or 608 Type II or IV.

Refrigerant sales restriction

Under the CAA, only Section 609 technicians may purchase small cans (less than 20 pounds) of refrigerant that is suitable for use in MVAC systems.

What equipment may be used to perform work?

Certified recovery and/or recycling equipment

All recovery and/or recycling equipment used must be certified by an EPA-approved testing organization. The recovery and/or recycling equipment used by LANL's support services contractor recovers and recycles both CFC-12 and HFC-134a refrigerant and has separate circuits for each refrigerant type and is certified by Underwriters Laboratories Inc. (UL). Review the operation manual for operating instructions, necessary maintenance procedures, and source information for replacement parts and repair.

The design of certified recovery and/or recycling equipment must not be altered in any way that would affect the equipment's ability to meet EPA certification standards. All recovery and/or recycling equipment must be used in accordance with the manufacturer's directions, unless the directions conflict with EPA requirements.

The **support services subcontractor** is responsible for the proper maintenance and documentation of the recovery and/or recycling equipment.

Low-loss fittings are to be used on all recovery and/or recycling equipment.

Maintaining, servicing, and repairing of MVACs and MVAC-like appliances

Overview

EPA's service requirements must be observed in accordance with 40 CFR §82, Subpart B while maintaining, servicing, and repairing of MVACs or MVAC-like appliances.

Who can handle refrigerants?

Only properly certified **refrigeration technicians** and **authorized purchasers** may purchase refrigerants. Only properly certified **refrigeration technicians** may use refrigerants. The support services subcontractor RCC provides the LANL Gas Plant with an accurate listing of technicians and authorized purchasers and up-dates the list when necessary.

Refrigerant inventory data

The **support services subcontractor RCC** provides all data necessary for RRES-MAQ to maintain an accurate and up-to-date inventory of refrigerants. The refrigerant cylinder information is recorded using the Refrigerant Cylinder Action Form, Attachment 1. It is recommended that the support service subcontractor perform occasional audits of their refrigerant inventory.

No venting of refrigerants

No person maintaining, servicing, and repairing of refrigeration appliances/equipment may knowingly vent, or otherwise release into the environment, refrigerant used in such equipment. *De minimus* releases associated with good faith attempts to recycle or recover refrigerants are not subject to this prohibition.

Maintaining, servicing, and repairing of MVACs and MVAC-like appliances, continued

Perform service work

When performing service work, the **technician** must keep in mind the following:

- Ensure that the appropriate recovery and/or recycling equipment evacuation levels are used before opening of the MVAC or MVAC-like appliance
- Do not mix refrigerant oil with other oils. Refrigerant oil has RCRA waivers for the amount of ODS's contained in the oil. If oils are mixed, the RCRA exemptions will not apply
- Ensure ALL new refrigerants are purchased from LANL's Gas Plant and that they have a LANL chemical tracking barcode number on the cylinder. In addition, all LANL recovery cylinders shall have a cylinder identification number. The support services subcontractor RCC is responsible for marking each recovery cylinder with a cylinder identification number
- Use low-loss fittings and hoses during maintenance, service, and repair functions
- Thoroughly document all service on service form

Complete service form

The LANL MVAC program has their own service form (Attachment 2) which they use to document the following information:

- LANL Work Order information
- Thorough description of service performed
- Refrigerant information (if applicable)

Tracking refrigerant cylinders

Using Refrigerant Cylinder Action form

Refrigeration technicians use the Refrigerant Cylinder Action Form (Attachment 1) to track any of the following information:

- any new cylinders to the inventory that did not come from the Gas plant
- transfer of ownership of a cylinder
- transfer of refrigerant from one cylinder to another
- disposal of a cylinder
- audit of refrigerant cylinders

Using Motor Vehicle Refrigerant Cylinder Log

Refrigeration technicians use the Motor Vehicle Refrigerant Cylinder Log (Attachment 3) to track refrigerant usage. The following information is required:

- date the work is performed
- Work Order number for the work performed
- cylinder ID of the refrigerant cylinder
- initials of the technician who performed the work
- any comments (if applicable)

Using cylinder tags

The "Refrigerant Cylinder Log" replaces the Gas Plant-applied cylinder tags.

Records resulting from this procedure

Service records

LANL's support services subcontractor under the MVAC program maintain their own service records. These service records are:

- LANL Work Order information
- Service Form (Attachment 2) with a thorough description of service performed and refrigerant information (if applicable)

All records must be kept on-site for a minimum of three years.

Records submitted by support services subcontractor to RRES-MAQ

The following records generated as a result of this procedure are to be submitted by the support services subcontractor RCC **within 10 working days** of work completion to RRES-MAQ:

- Refrigerant Cylinder Action Form (Attachment 1)
- Technician Certification Certificates (issued from EPA approved organization)
- Motor Vehicle Refrigerant Cylinder Log (Attachment 3; submit to RRES-MAQ upon completion of entire page or upon request)

Records entered into database by support services subcontractor

The following records generated as a result of this procedure are to be **entered** into the RCM™ database by the support services subcontractor RCC **within 10 working days** when completed, modified or added:

- Technician Certification Information (RCM™ entry)
- Recovery & Recycling Equipment Information & Proof of Certification (RCM™ entry; maintain manufacturer information for life of equipment)
- Recovery & Recycling Equipment Maintenance Records, when required by manufacturer (RCM™ entry)

Meteorology and Air Quality Group, MAQ

Refrigerant Cylinder Action Form

Page 1 of 1 — This form is from procedure RRES-MAQ-335

Use this form for ONE of the six actions in the three sections below.

☐ **New to inventory** ☐ **Disposal** ☐ **Audit** ☐ **Other:** _____ *(describe in Notes)*

Cylinder ID:			Refrigerant type:	
Cylinder currently assigned to:	☐ Zone: Zone number: _____ Division: _____			
	☐ Off-site: Name: _____			
Refrigerant condition:	☐ New ☐ Recycled ☐ Reclaimed ☐ Recovered ☐ Contaminated			
Cylinder size:	lb			
Tare weight:	lb	oz	Cylinder type:	☐ Refillable
Total weight:	lb	oz		☐ Returnable
Current quantity:	lb	oz		☐ Disposable
Purchased date: *(if known)*				
Inspected date on cylinder:		Next Inspection Date:		

☐ **Transfer of Cylinder Ownership**

Transferring ownership to:	☐ Zone: Zone number: _____ Division: _____			
	☐ Off-site: Name: _____			
Cylinder ID(s) being transferred:	1	2.	3.	4.
	5.	6.	7.	8.
	9.	10.	11.	12.

☐ **Transfer of Refrigerant to Recovery Cylinder**

From cylinder ID:	1.		2.		3.		4.	
Amount transferred:	lb	oz	lb	oz	lb	oz	lb	oz
From cylinder ID:	5.		6.		7.		8.	
Amount transferred:	lb	oz	lb	oz	lb	oz	lb	oz
To recovery cylinder ID:								

Date of action: ____/ _____/ _____

Notes:

_____ _____ _____ _____/_____/_____

Signature — Printed Name — Z Number — Date

Forward completed form to RRES-MAQ Meteorology and Air Quality Group.

SERVICE FORM

	TOTAL PARTS		
	OUTSIDE REPAIRS		
	ACCESSORIES, TIRES AND TUBES		
	TOTAL		

№ 0674

KSL
KBR • SHAW • LATA

P.O. Box 80 MS-A-199/MDHE
TA-60 Bldg. 001 Eniwetok Drive
Las Alamos, NM 87544
(505) 667-5177

NAME _____ DATE _____ 20 _____

ADDRESS _____ PHONE _____

CITY _____ PROMISED _____ AM PM

MAKE	MODEL	LICENSE NO.	MILEAGE	PHONE WHEN READY?
				☐ YES ☐ NO

MOTOR NO.	SERIAL NO.	SERVICE SALESMAN	CUST. ORDER NO.

QUAN.	DESCRIPTION OF WORK	FLAT RATE	AMOUNT	
	LUBRICATE ☐ CHANGE OIL ☐ FLUSH TRANS. ☐ FLUSH DIFF. ☐ WASH ☐ POLISH ☐			

Not Responsible For Loss or Damage to Cars or Articles Left in Cars in Case of Fire, Theft or Any Other Cause Beyond Our Control.

GAS, OIL AND GREASE	PRICE	F	S	
GALS. GAS @				
CHANGE OIL ☐ QTS. OIL @				
LBS. GREASE @				
Total Gas, Oil and Grease				

TOTAL LABOR	
TOTAL PARTS	
ACCESSORIES	
GAS, OIL GREASE	
TIRES TUBES	
OUTSIDE REPAIRS	
TAX	
TOTAL	

ESTIMATES ARE FOR LABOR ONLY MATERIAL IS EXTRA

I hereby authorize the above repair work to be done along with the necessary material, and hereby grant you and/or your employees permission to operate the car, truck, or vehicle hereia described on streets, highways or elsewhere for the purposes of testing and / or inspection. An express mechanic's lien is hereby acknowledged on above car, truck or vehicle to secure the amount of repairs thereto.

AUTHORIZED BY _____ RECEIVED BY _____

Meteorology and Air Quality Group, MAQ

MOTOR VEHICLE REFRIGERANT CYLINDER LOG

This form is from procedure RRES-MAQ-335

Date	Work Order Number	Cylinder ID	Initials of technician	Comments

Forward completed form to RRES-MAQ Meteorology and Air Quality Group.